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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,387	06/05/2002	John Gordon Rushbrooke	602-1551	4707
23644	7590	09/19/2005		
BARNES & THORNBURG P.O. BOX 2786 CHICAGO, IL 60690-2786			EXAMINER LAUCHMAN, LAYLA G	
			ART UNIT 2877	PAPER NUMBER

DATE MAILED: 09/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/018,387

Applicant(s)

RUSHBROOKE ET AL.

Examiner

L. G. Lauchman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 110-153 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 110-136 and 140-153 is/are rejected.
- 7) ☐ Claim(s) 137-139 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/06/2005 has been entered.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.

- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, in Claim 148, the reading heads positionable over a sample site must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. No new matter should be entered. In Claim 151, a fiber optic cable (guiding light to an individual sample sites) must be shown in the drawings. In Claim 152, the optical fibers (guiding light from the separate sites to individual detectors) must be shown in the drawings.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 119, 137, 138, 141 and 145 are objected to because of the following informalities: Claims 137, 141, 145 recite "additional shutter means synchronized with that associated with the light source to prevent light reaching the detectors whilst excitation light is projected into the system." Apparently this limitation is a modified last paragraph in page 16 of the specifications. However, the paragraph describes only one shutter means and merely elaborates the definition of the shutter as "further, shutter means may be...", and not as "further shutter means may be...". The new limitation should be rewritten as --said shutter means synchronized with the source to prevent light of any wavelength reaching the detectors while excitation light is projected into the system.-- Appropriate correction is required.

Claim 138, since claim 137 was amended by adding a new limitation "a filter...", the filter means of Claim 138 should be deleted.

In Claim 119 the term "the spectral filter" lacks antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 148-153 are rejected under 35 U.S.C. 102(e) as being anticipated by Volcker et al (US 6,686,582) as admitted prior art (see page 6 of the specifications, second paragraph).

The patent teaches a plurality of single channel optical systems and photoelectric detectors or detecting areas are arranged in parallel to form a plurality of reading heads arranged side-by-side so as simultaneously to read a corresponding plurality of adjacent sample sites, wherein the reading heads are independently adjustable so that each is accurately positionable over a sample site. (see entire patent, and Figs. 1 and 2).

The optical systems are arranged in a single line, use independent confocal systems, light is a single light source split into a plurality of beams and conveyed by as fiber optic cable.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 110 and 111 are rejected under 35 U.S.C. 103(a) as being unpatentable over Volcker et al (US 6,686,582), in view of Tiziani et al (Applied Optics, vol. 33, No. 4), and further in view of Dandliker et al (US Re.34,782)

Volcker teaches (see Figs. 2 and 1) a method, comprising focusing light emitted from each sample 11 (see Fig. 1) at infinity so as to form a parallel beam, further using a lens 42 to re-establish a parallel array of light beams so as to present to an addressable detector array a plurality of parallel light paths, and individually addressing different regions of the detector array onto which the parallel light paths impinge, and storing data relating to the quantity of incident light on each region of the detector array. Objective lenses are arranged above the sample array.

Volcker does not teach the pinhole aperture positioned at the focal point of the focusing lens. Tiziani et al use a small aperture for detection of light emanating from the focal point of the objective lenses of a microlens array in a similar method and apparatus. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the pinhole aperture in the invention of Volcker as taught by Tiziani, since the pinhole would provide attenuating unwanted fluorescence and improve the resolution of the optical system.

The combination of inventions of Volcker and Tiziani does not teach a shutter for inhibiting the transfer of light to the detector as it is claimed. However, Dandliker describes an apparatus for measuring fluorescence having a shutter 26 (see col. 8, line 67 through col. 9, line 23; col. 9 lines 51-66; col. 10, lines 56-59) for controlling fluorescence detected by the detector 34). It would have been obvious to one skilled in the art at the time the invention was made to provide a shutter Dandliker in the combination of inventions of Volcker and Tiziani, in order to

provide detecting within a particular time period so as to optimize the detection of the particular fluorescence.

AS to the location of the objective lens, if the system of Volcker the positions of the detector and the sample were switched so as the detector is below the sample and the remaining of the structure stayed the same, the lens 42 would have been below the sample. Switching the position of the sample and the detector would be obvious to one skilled in the art, since such change would not affect the operable capabilities of the Volcker's optical system and would accomplish the same results.

Claims 112-136, 140, 144 are rejected under 35 U.S.C. 103(a) as being unpatentable over Volcker et al (US 6,686,582), and further in view of Tiziani et al (Applied Optics, vol. 33, No. 4)

Volcker teaches (see Fig. 2) a method of imaging a plurality of micro-sample light emitting sites simultaneously onto separately addressable detectors (see col. 2, lines 33-43), so that light emitted from each site is monitorable by one of the detectors, wherein a corresponding plurality of objective lenses 21 each comprising a micro-lens are located adjacent to the micro-sample array 1 with one objective lens for each micro-sample, the latter are located at or near the focal point of each of the microlenses so that the light emanating from each micro-sample is collected by its respective objective lens and converted into a beam of parallel or near parallel rays, the objective lenses are arranged so that the axes of all the beams issuing therefrom are parallel and spaced apart. Volcker does not teach the pinhole aperture positioned at the focal point of the focusing lens. Tiziani et al use a small aperture for detection of light emanating from the focal point of the objective lenses of a microlens array in a similar method and apparatus. It would have been obvious to one of ordinary skill in the art at the time of the

invention to provide the pinhole aperture in the invention of Volcker as taught by Tiziani, since the pinhole would to provide attenuating unwanted fluorescence and improve the resolution of the optical system.

Volcker also teaches a filter and an aperture mask, see col. 5, lines 3 –13), and an array of 96 micro-lenses positioned to image on a spot of small size at the surface of the detector.

Claims 141-143, 145-147 are rejected under 35 U.S.C. 103(a) as being unpatentable over Volcker et al (US 6,686,582), in view of Tiziani et al (Applied Optics, vol. 33, No. 4), and further in view of Dandliker et al (US Re.34,782).

Volcker teaches (see Figs. 2 and 1) a method, comprising focusing light emitted from each sample 11 (see Fig. 1) at infinity so as to form a parallel beam, further using a lens 42 to re-establish a parallel array of light beams so as to present to an addressable detector array a plurality of parallel light paths, and individually addressing different regions of the detector array onto which the parallel light paths impinge, and storing data relating to the quantity of incident light on each region of the detector array. Objective lenses are arranged above the sample array.

Volcker does not teach the pinhole aperture positioned at the focal point of the focusing lens. Tiziani et al use a small aperture for detection of light emanating from the focal point of the objective lenses of a microlens array in a similar method and apparatus. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the pinhole aperture in the invention of Volcker as taught by Tiziani, since the pinhole would to provide attenuating unwanted fluorescence and improve the resolution of the optical system.

The combination of inventions of Volcker and Tiziani does not teach a shutter for inhibiting the transfer of light to the detector as it is claimed. However, Dandliker describes an

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apparatus for measuring fluorescence having a shutter 26 (see col. 8, line 67 through col. 9, line 23; col. 9 lines 51-66; col. 10, lines 56-59) for controlling fluorescence detected by the detector 34). It would have been obvious to one skilled in the art at the time the invention was made to provide a shutter Dandliker in the combination of inventions of Volker and Tiziani, in order to provide detecting within a particular time period so as to optimize the detection of the particular fluorescence.

Volcker does not teach a pinhole aperture located in front of the detector lens, circuit means and computing and analyzing circuit means along with the memory means. Tiziani et al use a small aperture for detection of light emanating from the focal point of the objective lenses of a microlens array in a similar method and apparatus. The article also teaches computing, analyzing and memory means (see p. 569, paragraph 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the pinhole aperture in the invention of Volcker as taught by Tiziani, since the pinhole would to provide an image of the micro-sample light emissions in the plane of an array of photoelectric detectors. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the invention of Volcker with the computing , analyzing and memory means in order to improve the efficiency of the fluorescence measurement. The detector array is a CCD array, which is equivalent to an array of photomultipliers.

Allowable Subject Matter

Claims 137-139 would be allowable if rewritten or amended to overcome the objections set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record taken along or in combination, fails to disclose or render obvious apertured masks placed on either side of the filter to collimate the parallel beam to reduce background and cross-talk, in combination with the rest of the limitations of the claim 137. Volcker suggests using aperture masks, however, the location of the masks in relation to the filter is not disclosed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to L. G. Lauchman whose telephone number is (571) 272-2418. The examiner's normal work schedule is 8:00am to 4:30pm (EST), Monday through Friday. If attempts to reach examiner by the telephone are unsuccessful, the examiner's supervisor Gregory J. Toatley, Jr. can be reached on (571) 272-2059, ext. 77.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Any inquiry of a general nature or relating to the status of this application should be directed to the TC receptionist whose telephone number is (571) 272-1562.

A handwritten signature in black ink, appearing to read 'L. G. Lauchman', with a large, stylized flourish at the end.

L. G. Lauchman
Primary Examiner
Art Unit 2877

September 16, 2005